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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/555,728	01/06/2006	William Wesley Martin	UDL36.001APC	2025
20995 7590 11/16/2009 KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			EXAMINER KNIGHT, DEREK DOUGLAS	
			ART UNIT 3655	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/555,728	Applicant(s) MARTIN, WILLIAM WESLEY	
	Examiner DEREK D. KNIGHT	Art Unit 3655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-20, 22-25 and 35-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-20, 22-25, 35 and 37-50 is/are rejected.
- 7) ☒ Claim(s) 36 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/30/2009 has been entered.

Claim Objections

Claim 41 is objected to because of the following informalities: The claim states "a transmission system" this should be --the transmission system--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 42-50 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the

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invention. The claims and the specification fail to disclose how applicant "briefly [interrupts the] torque to the transmission system" as stated in claim 42, line 22. There is no disclosure of any structure or details of a method for which one of ordinary would be able to make or use the invention in a manor disclosed in claim 42.

Claims 20 and 38-41 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 20 recites the limitation "the disc spring" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 38 recites the limitation "the second gear wheel" in line 7 and repeatedly throughout the claim. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 38, line 6, it is unclear to the examiner what the first gear wheel is rotatably mounted on. It appears to the examiner that certain details have been omitted from claim 38 between lines 6 and 7. Examiner believes lines 7-9 of claim 42 contain the missing details of claim 38.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 42, 43, 45-49 rejected under 35 U.S.C. 102(b) as being anticipated by **THOMAS (US 3,872,737)**.

Regarding **claim 42**, THOMAS discloses a method for performing a kickdown downshift in a transmission system, said method including: providing a transmission system having first (21) and second (10) rotatable shafts, said first shaft having a longitudinal axis, providing first and second gear trains for transferring drive from one of the shafts to the other shaft, the first gear train including a first gear wheel (29) rotatably mounted on the first shaft and the second gear train includes a second gear wheel (27) rotatably mounted on the first shaft, said first and second gear wheels having drive formations (59) formed thereon, and said second gear wheel (27) being part of a higher gear than the first gear wheel (29); selectively transmitting torque between the second gear wheel and the first shaft via a selector assembly including an actuator assembly, and first (36) and second (37) sets of engagement members by engaging the second gear wheel (27) with the first set of engagement members (36) such that each of the engagement members (61) in the first set engages the second gear wheel (27) with a first engagement face (63), and by engaging the second gear wheel with the second set of engagement members (37) such that each of the engagement members in the second set engages the second gear wheel with a first engagement face (on 43); starting from a position wherein the first set of engagement members drivingly engages the second gear wheel and the second set of engagement members (37) is in an unloaded condition with respect to the second gear wheel; briefly interrupting torque to the transmission system to disengage the first set of engagement members from the

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second gear wheel; and subsequently moving the unloaded second set of engagement members (37) along the longitudinal axis of the first shaft into engagement with the first gear wheel (29) such that each of the engagement members (61) in the second set engages the second gear wheel with a second engagement face (63) thereby transmitting torque between the first shaft and the first gear wheel, to effect the gear change.

Regarding **claim 43**, THOMAS discloses moving the first set of engagement members into engagement with the first gear wheel after the second set of engagement members has engaged the first gear wheel such that each of the engagement members in the first set engages the second gear wheel with a second engagement face.

Regarding **claim 45**, THOMAS discloses the actuator assembly includes a shift fork (66) assembly and the method includes moving the first and second sets of engagement members independently of each other by action of the shift fork assembly.

Regarding **claim 46**, THOMAS discloses the shift fork assembly includes a shift fork and resilient means (47) for connecting the first and second sets of engagement members to the shift fork, including moving the first and second sets of engagement members via the resilient means when the shift fork is actuated.

Regarding **claim 47**, THOMAS discloses engaging the second gear wheel with the first and second sets of engagement members includes moving the first and second sets of engagement members in a first direction along the longitudinal axis of the first shaft into engagement with the second gear wheel by action of the shift fork assembly, and wherein moving the first set of engagement members into engagement with the first

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gear wheel includes moving the first set of engagement members in a second direction along the longitudinal axis of the first shaft into engagement with first gear wheel by action of the shift fork assembly.

Regarding **claim 48**, THOMAS discloses biasing the first set of engagement members towards the first gear wheel while it is drivingly engaged with the second gear.

Regarding **claim 49**, THOMAS discloses providing a transmission system having at least one further shaft (13).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 7-19, 22-24, 35, 37-41 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over **THOMAS (US 3,872,737)**.

Section 2112.02 of the MPEP states, "Under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device."

Regarding **claim 1**, **THOMAS** discloses a transmission system comprising first (21) and second (10) rotatable shafts, said first shaft having a longitudinal axis, and means for transferring drive from one of the shafts to the other shaft comprising first (27) and second (29) gear wheels each rotatably mounted on the first shaft and having

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drive formations (59) formed thereon, a selector assembly for selectively transmitting torque between the first shaft and the first gear wheel and between the first shaft and the second gear wheel, wherein the selector assembly comprises an actuator assembly and first (37) and second (36) sets of engagement members, wherein each engagement member includes a first engagement face (61 or 43) for engaging the first gear wheel and a second engagement face (the other one of 61 or 43) for engaging the second gear wheel, said actuator assembly including a shift fork (66) assembly arranged to move each of the first and second sets of engagement members in first and second directions along the longitudinal axis of the first shaft into and out of engagement with the first and second gear wheels independently of each other, the arrangement being such that when one of the first and second gear wheels is selected by the first and second sets of engagement members there is backlash between the first and second sets of engagement members and the drive formations when moving between acceleration and deceleration, and the transmission being further arranged such that when the first gear (27) is selected by the first and second sets of engagement members and a driving force is transmitted the second set of engagement members (36) drivingly engages the selected first gear wheel, and the first set of engagement members (37) is then in an unloaded condition, wherein the shift fork assembly is arranged to move the unloaded first set of engagement members into driving engagement with the second gear wheel to effect a gear change.

THOMAS discloses the claimed invention except for the backlash being less than or equal to four degrees when moving between acceleration and deceleration.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to limit the backlash to such a range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding **claim 2**, **THOMAS** discloses the selector assembly is arranged such that when the first gear wheel is engaged by the first and second sets of engagement members and a braking force is transmitted the first set of engagement members (37) drivingly engages the engaged gear wheel, and the second set of engagement members (36) is in an unloaded condition, and when a driving force is transmitted the second set of engagement members drivingly engages the engaged gear wheel, and the first set of engagement members is then in an unloaded condition.

Regarding **claim 3**, **THOMAS** discloses the actuator assembly is arranged to bias the loaded set of engagement members towards the unengaged gear wheel without disengaging the loaded set of engagement members from the engaged gear wheel. This occurs during the shifting operation via the spring (47).

Regarding **claim 4**, **THOMAS** discloses the first and second sets of engagement members are arranged to rotate, in use, with the first shaft.

Regarding **claim 5**, **THOMAS** discloses the first shaft is an input shaft and the second shaft is an output shaft and drive is transferred from the input shaft to the output shaft. This occurs during deceleration conditions, when the wheels are actually turning the transmission.

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Regarding claim 7, THOMAS discloses the drive formations on the first and second gear wheels comprise a first and second group of dogs respectively. The dogs are not numbered, but springs (54) are resting against the dog members. See Fig. 6 of THOMAS.

Regarding claim 8, THOMAS discloses the first and second groups of dogs each comprise between two and eight dogs, evenly distributed on the first and second gears respectively.

Regarding claim 9, THOMAS discloses the first and second groups of dogs each comprise between two and four dogs.

Regarding claim 10, THOMAS discloses the first and second sets of engagement members comprise between two and eight members.

Regarding claim 11, THOMAS discloses the first and second sets of engagement members comprise between two and four members, and preferably three members.

Regarding claim 12, THOMAS discloses the first shaft comprises keyways (41) arranged such that the first and second sets of engagement members can slide axially along the keyways and to radially restrain the positions of the sets of engagement members.

Regarding claim 13, THOMAS discloses a cross-section of the keyways is one of T-shaped, slotted, and dovetailed.

Regarding claim 14, THOMAS discloses the actuator assembly comprises at least one resiliently deformable means (47) for connecting a shift fork (66) to at least

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one of the first and second sets of engagement members: said at least one resiliently deformable means being arranged to move at least one of the first and second sets of engagement members into engagement with the first and second gear wheels in response to movement of the shift fork.

Regarding claim 15, THOMAS discloses the at least one resiliently deformable means is arranged to bias at least one of the first and second sets of engagement members towards the first or second gear wheel when the engagement members are drivingly engaged with a gear wheel.

Regarding claim 16, THOMAS discloses the actuator assembly comprises first and second resiliently deformable means (47) connected to the first and second sets of engagement members respectively such that the first resiliently deformable means acts on the first set of engagement members and the second resiliently deformable means acts on the second set of engagement members.

Regarding claim 17, THOMAS discloses the at least one resiliently deformable means is connected to the first and second sets of engagement members such that the resiliently deformable means acts on both the first and second sets of engagement members.

Regarding claim 18, THOMAS discloses the members of the first and / or second sets of engagement members can perform limited axial movement relative to each other in the keyways.

Regarding claim 19, THOMAS discloses the resiliently deformable means is a spring.

Regarding claim 22, THOMAS discloses the drive formations are arranged such that they do not extend beyond the outside diameter of the gear wheels.

Regarding claim 23, THOMAS discloses the first and second groups of dogs each comprise three dogs. See Fig. 6 of THOMAS.

Regarding claim 24, THOMAS discloses the first and second sets of engagement members comprise a plurality of members.

THOMAS does not disclose there being three members.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have three members, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 35, THOMAS discloses the first and second engagement faces each have a retention angle.

THOMAS does not disclose the retention angle being in the range of 2.5 to 15 degrees.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a retention angle in the range of 2.5 to 15 degrees, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 37, THOMAS discloses the transmission system including at least one further shaft (13).

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Regarding claim 38, THOMAS discloses a method for performing a decelerating downshift in a transmission system, said method including: providing a transmission system having first and second rotatable shafts, said first shaft having a longitudinal axis; providing first and second gear trains for transferring drive from one of the shafts to the other shaft, the first gear train including a first gear (29) wheel rotatably mounted on selectively transmitting torque between the second gear wheel (27) and the first shaft via a selector assembly including an actuator assembly having a shift fork assembly, and first (37) and second (36) sets of engagement members by engaging the second gear (27) wheel with the first set (37) of engagement members such that each of the engagement members in the first set engages the second gear wheel with a first engagement face (43), and by engaging the second gear wheel (27) with the second set (36) of engagement members such that each of the engagement members in the second set engages the second gear wheel with a first engagement face (63), and such that there is backlash between the first and second sets of engagement members and the drive formations when moving between acceleration and deceleration; and starting from a position wherein the second set of engagement members (36) drivingly engages the second gear wheel (27) and the first set of engagement members (37) is in an unloaded condition with respect to the second gear wheel, initially moving the unloaded first set of engagement members (37) along the longitudinal axis of the first shaft by action of the fork assembly into engagement with the first gear wheel (29) such that each of the engagement members in the first set (37) engages the second gear wheel

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with a second engagement face (63), thereby transmitting torque between the first shaft and the first gear wheel to effect the gear change.

THOMAS discloses the claimed invention except for the backlash being less than or equal to four degrees when moving between acceleration and deceleration.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to limit the backlash to such a range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 39, THOMAS discloses moving the second set of engagement members into engagement with the first gear wheel after the first set of engagement members engages the first gear wheel, such that each of the engagement members in the second set engages the second gear wheel with a second engagement face.

Regarding claim 40, THOMAS discloses engaging the second gear wheel with the first and second sets of engagement members includes moving the first and second sets of engagement members in a first direction along the longitudinal axis of the first shaft into engagement with the second gear wheel by action of the shift fork assembly, and wherein moving the first set of engagement members into engagement with the first gear wheel includes moving the first set of engagement members in a second direction along the longitudinal axis of the first shaft into engagement with first gear wheel by action of the shift fork assembly.

Regarding claim 41, THOMAS discloses providing the transmission system with at least one further shaft.

Regarding claim 44, THOMAS discloses engaging one of the first and second gear wheels having backlash between the first and second sets of engagement members and the drive formations when moving between acceleration and deceleration when one of the first and second gear wheels is engaged by the first and second sets of engagement members.

THOMAS does not disclose the backlash being less than or equal to four degrees when moving between acceleration and deceleration.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to limit the backlash to such a range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over **THOMAS (US 3,872,737)** as applied to claims 1-5, 7-19, 21-24, 26 and 34 above, and further in view of **THOMAS (US 4,098,380)**.

THOMAS _737 discloses a transmission system having resiliently deformable means (47) which are springs.

THOMAS _737 does not disclose the springs being disc springs.

THOMAS _380 teaches a transmission system having resiliently deformable means as disc springs (76)

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the springs of THOMAS _737 to be disc springs in view of THOMAS _380 in order to save space within the transmission system, because disc springs occupy less axle space than coil springs allowing for a more compact, space-saving design.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over **THOMAS (US 3,872,737)** in view of **THOMAS (US 4,098,380)** as applied to claim 25 above, and further in view of **MILLER (US 4,241,818)**.

The combination of THOMAS - THOMAS discloses a disc spring within a transmission system.

The combination of THOMAS - THOMAS does not disclose the disc spring comprising a plurality of arms, each arm having a first part that extends circumferentially around a portion of the disc spring and a second part that extends substantially radially inwards.

Miller teaches a disc spring (42) having a plurality of arms (44), each arm having a first part that extends circumferentially around a portion of the disc spring and a second part that extends substantially radially inwards (see Fig. 3 of Miller).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the disc spring of the combination of THOMAS - THOMAS such that the disc spring would have arms in view of MILLER to achieve various spring characteristics.

Response to Arguments

Applicant's arguments filed 10/30/2009 have been fully considered but they are not persuasive. Applicant argues that Thomas_737 does not disclose or suggest a system for initially moving an unloaded first set of engagement members into driving engagement with a first gear wheel to effect a decelerating downshift. Examiner disagrees. The disclosure of Thomas details the downshifting operation in liens 33-56 of column 6. It is the unloaded engagement member that is first moved to the new gear and is engaged with its drive formation (59) with the connector element (61) see lines 49-51 of column 6.

Applicant also argues that Thomas_737 does not disclose that backlash between first and second sets of engagement members and drive formations when moving between acceleration and deceleration is less than or equal to four degrees. Examiner disagrees with this argument. Thomas_737 discloses the drive formations (59) being between the engagement members (@ 61 on the one side and @ 43 on the other). Lines 19-22 of column 6 disclose the member (43) being formed to "limit rearward movement of the adjacent connector element (59)". This statement discloses backlash. Discovering the optimum value of backlash involves only routine skill in the art.

Allowable Subject Matter

Claim 36 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Claim **50** would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEREK D. KNIGHT whose telephone number is (571)272-7951. The examiner can normally be reached on Mon - Friday, 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David D. Le can be reached on (571) 272-7092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roger L Pang/
Primary Examiner, Art Unit 3655
/D. D. K./
Examiner, Art Unit 3655